

I claim:

1. A micro-dispensing nozzle comprising:

5 a housing with at least one exit orifice;
 a magnetostrictive valve in proximity to said orifice, said
 magnetostrictive valve having an open state and a closed
 state;

10 a means for applying a magnetic field to said
 magnetostrictive valve, said magnetostrictive valve
 changing shape in response to said magnetic field, said
 changing shape causing said orifice to change states.

15 2. The magnetostrictive dispensing nozzle of claim 1 wherein
 said magnetostrictive valve contains a magnetostrictive rod.

3. The magnetostrictive dispensing nozzle of claim 2 wherein
 said magnetostrictive rod lengthens under application of a
20 magnetic field.

4. The magnetostrictive dispensing nozzle of claim 3 wherein

said magnetostrictive rod is held in a pre-extended state by a bias magnetic field.

5. The magnetostrictive dispensing nozzle of claim 4 wherein
5 said pre-extended state of said magnetostrictive rod is relaxed upon application of a control magnetic field, whereby said rod contracts upon application of said control magnetic field causing said orifice to open.

10 6. The magnetostrictive dispensing nozzle of claim 1 wherein
said magnetostrictive valve contains a magnetostrictive particle.

7. The magnetostrictive dispensing nozzle of claim 1 wherein
15 said magnetostrictive valve contains a magnetostrictive layer.

8. The magnetostrictive dispensing nozzle of claim 1 wherein
said housing contains an entrance orifice, said entrance orifice coupled to a precision pump.

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9. The magnetostrictive dispensing nozzle of claim 1 wherein
said means for applying a magnetic field is a magnetic

field coil exterior to said housing.

10. A magnetostrictive valve to control pico-liter flow from a

fluid containing housing said valve comprising a

5 magnetostrictive rod extending into an exit orifice of said

housing, said valve being extended to close said exit orifice by

a bias magnetic field, said rod responding to an applied control

magnetic field to contract allowing said exit orifice to open.

11. The magnetostrictive valve of claim 10 wherein said rod is

10 around 2 mm in diameter.

12. The magnetostrictive valve of claim 10 wherein said rod is

around 30 mm in length.

15 13. The magnetostrictive valve of claim 10 wherein said bias

magnetic field is supplied by a permanent magnetic.

14. The magnetostrictive valve of claim 10 wherein said

magnetostrictive rod is operated faster than 1 kHz.

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15. A magnetostrictive valve method comprising the steps of:

placing a piece of magnetostRICTive material in proximity
to an exit orifice of a fluid containing housing;

5 maintaining pressure on fluid in said fluid containing
housing;

applying a magnetic field to said magnetostRICTive material
to cause said magnetostRICTive material to change shape,
whereby said exit orifice is blocked or un-blocked
10 according to said magnetic field.

16. The magnetostRICTive valve method of claim 15 wherein said
magnetostRICTive material is a magnetostRICTive rod.

15 17. The magnetostRICTive valve method of claim 16 further
comprising the step of pre-extending said magnetostRICTive rod
with a bias magnetic field.

18. The magnetostRICTive valve method of claim 17 wherein said
20 bias magnetic field is supplied from a permanent magnet.

19. The magnetostRICTive valve method of claim 15 wherein said

pressure is maintained by a precision pump.

20. The magnetostrictive valve method of claim 19 wherein
controlling of said pump and controlling of applying said
5 magnetic field is by a processor.

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